UNFORESEEN CONSEQUENCES

THOMAS KAISERFELD

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FAILURES?

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Foreword: Failures?

"Try again. Fail again. Fail better." Samuel Beckett's words are now legendary. There seems to be no crisis, setback or adversity from which it is impossible to learn. Failure carries its counterpart – success – within. Listen to the countless biographical radio programmes about fiascos that turn to triumphs, Google for failures, see how self-help books are structured. Perhaps it has always been this way – or is this a consequence of our era's accelerating demands for success, growth, advancement and evolution?

The American historian Scott A. Sandage, who researched the cultural history of failure in the US, claims that failure has become personal since the mid-nineteenth century – you don't just fail, you are a failure. He even talks of a nation of winners and losers, in which everyone is either the one or the other. Failure is thus a constant and shadowy companion to the American dream, an ever-present component of the American experience. Sandage links this to several factors, including modern society's perpetual evaluation and our time's statistical exposure of private lives. In the nineteenth century, the

innovation of statistics collection seemed to reveal in real time previously hidden – or at least obscured – connections relating to the population and society. In the US, this also coincided with the credit institutes' division of the populace into those who were creditworthy and others – which is to say, losers. In addition, Sandage sees a link with the rise of meritocracy. The statistics demonstrated, incontrovertibly, that the masses were nothing other than mediocre.[1]

Sweden is also a nation of mediocrity, just like every other nation, and here too – even if we are not as influenced by the idea of an American dream – mediocrity is associated with a lack of success, rather than a normal distribution. There are people who believe that we are now living in an age of perfectionism, placing sky-high expectations on ourselves. Nothing other than flawless will do, and everything that doesn't make it is pretty much a failure. These growing demands for ultimate excellence are regarded by the Public Health Agency of Sweden as one reason for the current rise in mental illness.[2] The same trend seems to be occurring in the rest of the West, and perfectionism is said to have increased since the 1980s.[3] In his most recent book, the British psychologist and researcher Thomas Curran writes of a hidden epidemic that is haunting the modern, capitalist Western world, where the tougher demands we wrestle with mean that we are increasingly likely to fail – and are particularly

likely to dread this failure.[4] That fear inhibits us, Curran claims.

Our contemporary individualism, enthusiasm for evaluation and constant searching for something that is occasionally vague but better – yes, "more perfect" – makes us ever-more vulnerable to failure. However, in itself, of course, failure is nothing new. Quite the opposite, setbacks and adversity are part and parcel of being human.

Mistakes, errors and a lack of success have, for centuries, comprised the very foundation of science and research as we know it. Trial and error. We could even claim that, fundamentally, science is about daring to get things wrong and then learning from your mistakes. A researcher makes predictions and finds regularities, patterns and laws in what appears to be chaos. The periodic table and the discoveries of Newton, Linnaeus and Einstein are just a few examples; new theories replace old ones, errors are found, and systems improved or discarded. Faults and troubleshooting are part of the process, and what the Enlightenment, modernity, progress, was all about was this: taming and mastery through rules, predictions and – yes – finding mistakes.

We are now seeing indications that fewer scientific breakthroughs are occurring – at least if by breakthrough we mean scientific achievements that move our knowledge in a completely new direction. This is happening despite our faith in research and all the global resources invested

in it.[5] Is the lack of breakthroughs a failure of our times? And, if so, is it our fear of failure that makes us less bold and thus less likely to explore new directions?

We could ask ourselves whether anyone now believes in progress and the future in the way that people did in the 1960s. In this way, we live in a darker world – or are we just less naïve? And there are fiascos, for individuals and for societies, that are difficult to learn from, and where the lesson is perhaps just to put it all behind you and move on.

Still, if we swept all those fiascos under the rug, if all our setbacks were hidden and forgotten, we would not have made any progress. We are somewhere between these extremities, daring to see the mistake for the shambles it is, sometimes with no lesson to be learned, and to use it. In this essay collection, six researchers from the humanities and social sciences take a closer look at failure and the unintended consequences of success.

They range from the allegedly unsuccessful 'Million Programme' for public housing, to whether or not nuclear power should be regarded as an unsuccessful technology. In this essay, historian of ideas Thomas Kaiserfeld attempts to untangle what failures are and how we have managed them through history, as well as how we are affected by modern life's continual evaluations. Emoticons, anyone?

Almost everything we do has unintended consequences, and it is far from obvious what constitutes a failure – particularly when little time has passed. According to Walter

Benjamin, the angel of history sees the past as a long chain of catastrophes, while being propelled back-first into the future on a storm called progress.

Someone who continues to read Samuel Beckett's famous lines on having another go, soon realises that he is not delivering an optimistic call for success, but rather a pitch-black description of failure:

> Try again. Fail again. Better again. Or better worse. Fail worse again. Still worse again. Till sick for good. Throw up for good. Go for good. Where neither for good. Good and all.[6]

Jenny Björkman

Notes

1. Scott A. Sandage, *Born Losers: A History of Failure in America*, Cambridge, MA: Harvard University Press, 2005.

2. Public Health Agency of Sweden, "Varför har den psykiska ohälsan ökat bland barn och unga i Sverige?", Solna: Folkhälsomyndigheten, 2018, www.folkhalsomyndigheten.se/publicerat-material/publikationsarkiv/v/varfor-har-den-psykiska-ohalsan-okat-bland-barn-och-unga-i-sverige/. See also "Young people drowning in a rising tide of perfectionism", *The Conversation* 5 February 2019, https://theconversation.com/young-people-drowning-in-a-rising-tide-of-perfectionism-110343.

3. Thomas Curran & Andrew P. Hill, "Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to

2016", *Psychological Bulletin* vol. 145, no. 4, 2019, pp. 410–429.

4. Thomas Curran, *The Perfection Trap: The Power of Good Enough in a World that Always Wants More*, London: Cornerstone Press, 2023.

5. Michael Park, Erin Leahey & Russell J. Funk, "Papers and patents are becoming less disruptive over time", *Nature* no. 613, 2023, pp. 138–144.

6. Samuel Beckett, *Worstward Ho*, 1983.

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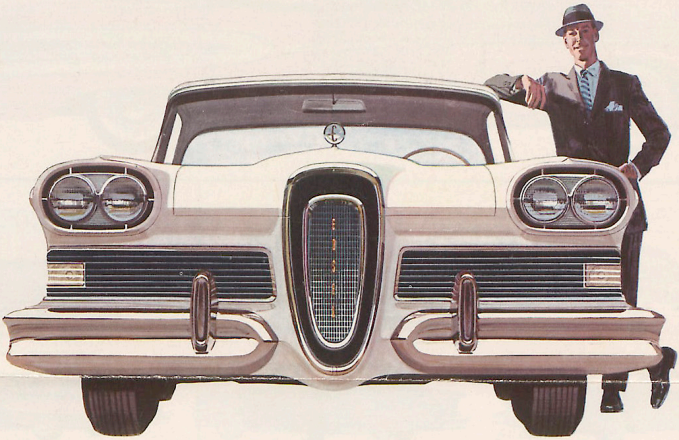

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Pride comes before a fall

In the history of ideas, at least in a Western context, one foundation on which to discuss failures and unexpected consequences must be the tragic myth of Icarus. This tells of how the artist and inventor Daedalus fled from Athens to the island of Crete with his son Icarus, to escape punishment for attempted murder. Once there, in exchange for being given asylum, he performed tasks for King Minos; one of these was to construct a labyrinth in which the Minotaur, part bull and part man, could be held captive. Eventually, Daedalus fell from favour and found himself imprisoned in the labyrinth, along with his son. Still, thanks to his ingenuity, he successfully constructed two pairs of wings from feathers and candle stumps he found in the labyrinth. Using these, Daedalus and Icarus were able to fly away from the labyrinth and Crete, out over the sea – but during their flight, Icarus was filled with overconfidence, or hubris, flying higher and higher, closer and closer to the Sun. Finally, he got so close that the wax in his wings melted, and they disintegrated. Icarus plunged into the Aegean Sea and drowned.

↳ Advertisement for an ambitious automobile project, described on pp. 42–45.

The story of Icarus mirrors a familiar biblical theme, that pride comes before a fall (Proverbs 16:18). Indeed, the idea that failure is preceded by overly grandiose plans that involve taking risks – be they known or not – recurs in a number of more recent key narratives about failure. Many of them explain disasters as chance events that had unintended, or at least unexpected, consequences for the vast majority of people.

Two of the most famous examples of this are the sinking of the passenger ship *Titanic* after she collided with an iceberg in April 1912, and the fire on the German airship *Hindenburg*, twenty-five years later. In *Titanic*'s case, this was a maiden voyage that had been widely publicised and debated in advance. For *Hindenburg*, the accident occurred at the end of the second of ten planned transatlantic passenger flights. Both vessels were famous as the world's largest ship and airship, respectively, which has certainly contributed to both accidents becoming associated with hubris. Another familiar example in the same genre is the 1986 *Challenger* space shuttle disaster, although this wasn't a maiden flight, far from it. However, the launch in Florida was broadcast live on American television, because one passenger was the first civilian in space, high school teacher Christa McAuliffe. Here, the hubris was based on the notion that space travel had become so commonplace and safe that civilians could also participate, following less rigorous training.

Although the stories of these accidents emphasise how they were unexpected, in each case there were people who knew of the risk and tried to raise the alarm. The *Titanic* was warned about an unusually high number of icebergs on her planned route, so her course was set somewhat further south but, when new warnings were issued a few days later, the bridge decided that any icebergs would be detected in time to avoid a collision. The cause of the *Hindenburg* fire is not entirely clear, but many people have blamed the US embargo on helium exports to Germany. For the airship to lift, helium was replaced by the vastly more flammable hydrogen gas, which resulted in a very rapid chain of events during the landing outside New York. The risk to *Challenger* was also known; some engineers had advised against a launch due to the unusually cold weather, as this increased the danger that seals in the rocket boosters would not withstand the force of pressurised gas. And this was what happened: a seal was breached by hot gas that burned a hole in the fuel tank, which exploded.

And so it continues. Many of the most famous unforeseen disasters turn out, on closer inspection, not to have been so impossible to predict. Of course, nor is it so surprising that the same applies to economic crises. There are so many experts with differing perspectives and opinions that every setback, from the 1929 Wall Street Crash to the 2008 financial crisis, has been predicted by at least one or more pundits.

There are also disasters that have been genuinely unforeseeable, in the sense that no one possessed the knowledge necessary to predict what would happen. This applies, for example, to some structures, such as the first bridge over the Tacoma Narrows in the US state of Washington. This collapsed four months after it was inaugurated in July 1940 due to winds creating eddies that caused the bridge to oscillate so violently that the cables on which it hung eventually broke. Despite wind speeds well below gale force, the bridge started to 'self-oscillate', generating waves in the road that had increasingly higher peaks and deeper valleys, until it collapsed. At this time, there was limited knowledge of the oscillations that can arise due to the varied loads on bridges, so this course of events could not have been predicted. The bridge had an unusually narrow design in relation to its length, with relatively low beams along its sides; these factors contributed to its powerful self-oscillation even in moderate winds.

Failures, accidents and the Swiss cheese model

Against this background, it may be useful to distinguish between failures that, in context, could have been predicted and accidents that were genuinely unforeseeable. Both cases are setbacks, but only the first case involves failure as the result of a calculated risk. In the second case, the risk cannot be considered, so it is in principle incalculable.

However, such distinctions are often difficult to maintain in practice. Consider, for example, global warming. For a long time, we were completely unaware that carbon dioxide emissions were a problem. At the end of the nineteenth century, Swedish chemist Svante Arrhenius theorised that carbon dioxide in the atmosphere caused the climate changes responsible for the alternation of ice ages and warmer periods. Towards the end of the 1950s, American scientists discovered that carbon dioxide levels were changing and, in subsequent decades, it became increasingly clear that there was a growing trend. At the same time, the idea emerged that human emissions of carbon contributed to these rising levels and warming atmosphere. However, there is no way of knowing more precisely

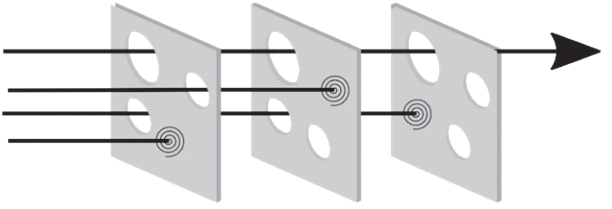
when this realisation became so widespread that the heating climate can be discussed in terms of human failure, rather than being an unavoidable accident.

The same thing applies to the similar division of failures into those resulting from self-inflicted errors, committed under normal circumstances, and accidents that result from influences of the more extreme kind. From this perspective, Icarus' flight from Crete can probably be considered a failure, since it was reasonable to assume that the wax in his wings would melt when he got too close to the heat of the Sun. With the same reasoning, the fate of the *Hindenburg* should most likely be regarded as an accident, because the fire was so rapid and so deadly due to hydrogen being used instead of helium, circumstances that were unplanned and hardly normal. Whether the sinking of the *Titanic* should be seen as a failure or an accident is more difficult to decide – yes, icebergs were known to be in the area but, in itself, this was not an extreme situation. Moreover, there were high hopes that they would be detected in time, and the ship had also been branded as exceptionally safe. Regardless of how these distinctions are made, it is difficult to separate self-inflicted failures from accidents; the lines must be drawn using judgement, and will be neither clear-cut nor universal.

It is often said that an accident was caused by human error, frequently with the implicit assumption that it would have been difficult to avoid. At the same time, the

reference to the human factor implies that the outcome was not due to external influences, rather that the explanation for the accident lies in a failure of human intervention, be it direct or indirect. Whether the car crashed because the driver was drunk, which is a direct intervention, or because the brakes were incorrectly designed or worn out, meaning an indirect intervention in the form of inadequate attention, the crash was caused by human action. If so, there should have been every opportunity to avoid it happening.

A more systematic way of discussing direct and indirect human interventions is called the Swiss cheese model. This is the idea that one intervention is rarely enough to prevent failure; several organisational improvements are often necessary to avoid setbacks. The name refers to the holes in a Swiss cheese which, in the model, represent various risks and uncertainties that can be difficult to predict. If you pile up a few cheese slices, the chance is that there will be overlapping holes, allowing you to see all the way through the slices. But, if you pile up enough cheese slices, all the holes will eventually be covered. The idea is that many different types of interventions and preventive actions, or cheese slices, are necessary to stop disasters occurring. The more and the larger the holes, the more cheese slices are needed to cover them. If, despite various disparate measures, there is a hole that goes all the way through – a series of uncertainties – there is a greater risk



The Swiss cheese model for organisational risk management.

of a crash. Organisational vulnerabilities (such as regulations or the level of training) produce risks, or holes, which can be called latent conditions, equivalent to indirect influence. Other holes in the cheese slices comprise individual actions and are more closely linked to underlying psychological factors, such as breaches of rules, norms or practices. These are called active failures and are equivalent to direct influence. When latent conditions and active failures coincide, like the holes in a pile of Swiss cheese slices, the result can be a series of unforeseen consequences.[1]

The sinking of the royal Swedish warship *Vasa*, in 1628, is another example of the difficulty in distinguishing between accidents and failures, and is also a good fit for both the Swiss cheese model and the idea of pride before a fall. *Vasa* had a relatively new and daring construction for a ship at that time. With two gun decks, she was advanced but not entirely unique, at least not in terms of size or

armaments. In *Vasa*'s case, pride instead lay in the impressive weight of the ammunition that could be fired from one side of the ship in a single volley, about 270 kilos, which was something of a world record in the late 1620s.

It is still unclear whether the shipbuilders had understood the risks this entailed, by causing the ship to become unstable. However, when Swedish Navy's Admiral Clas Fleming ordered a traditional stability test, in which the crew ran from one side to the other, before construction was completed, it was apparent to everyone present that the ship listed more than was healthy. Still, because the Swedish King Gustavus Adolphus had his hands full in Poland and was also sending letters demanding that *Vasa* be completed as quickly as possible, those in charge continued with the plans anyway, probably from the fear of opposing the king's express wishes. Work progressed despite the indications of the ship's instability.

What was known and unknown during the construction process' various stages and the extent to which the risk of failure could be foreseen by those involved is difficult, if not impossible, to assess. One not entirely unfounded guess is that the ship's instability was initially impossible to predict, but that after Admiral Fleming's stability test it was clear to many that the ship was unseaworthy, except in very calm weather. *Vasa*'s construction was thus initially successful, but gradually turned into a failure.

In terms of external influences, the picture can be complicated in a similar way: yes, the royal ship was slender, but she could still sail in calm waters, and at the beginning of her maiden voyage there was virtually no wind. However, just as *Vasa* emerged from the lee of the island of Södermalm, in Stockholm harbour, a gust of wind blew up from the southwest. The ship heeled so significantly that water flooded in through the open gun ports, and she continued tilting until she could not right herself and sank. Clearly, the weather conditions can be identified as an external factor that contributed to the sinking of the *Vasa*, which could thus be described as an accident. Of course, it is reasonable for a great warship to cope with hard weather, which means that her sinking should nonetheless be seen as a failure that can be blamed on human factors, as the circumstances were not particularly extreme. In this case, the weaknesses, or holes in the Swiss cheese, are quite easy to identify: the latent conditions were the impressive ambition and her slender construction; an active failure was Admiral Fleming's decision not to abort the maiden voyage so as not to displease the king. In both cases, there were indirect and direct human actions that led to the disaster.

However, it is often difficult to distinguish between what should regarded as predictable and what is not, just as it is difficult to draw clear distinctions between self-inflicted failures and accidents due to external circumstances.

In most cases, this type of analysis is based on assessments about predictability and what can be reasonably assumed about the external conditions. It is simply a matter of judgement as to how extreme an external influence must be for its consequences to be called unforeseen, and thus lead to an accident rather than a failure.

Homo aestimans, the evaluative human and social failures

Evaluating performance is a fundamental prerequisite when discussing failure in ways other than using internal and external risk factors that can be summarised through a Swiss cheese metaphor, or through culturally-bound morality tales about how pride comes before a fall. One apparently rational way of discussing failures and unforeseen consequences is to analyse outcomes against previously set targets. Also, assessing the effort put into something not only applies to major societal projects, but actually characterises most of what we do, at any scale. Was that missed career step due to my own faults or my manager's antipathy? Was the dinner party successful thanks to the food or the company? What did the children really think of their Christmas presents? These questions touch on what can be called social failures, from not fitting in at a party to ending up in social deprivation.[2]

Some social thinkers have regarded our interest in evaluating everything and everyone as fundamental to our existence, not just in our own little cultural circle, but for humanity as a whole. *Homo aestimans*, the evaluative

human, unceasingly divides life into successful and unsuccessful endeavours and projects.[3] With this perspective, what brings humanity together is that we constantly evaluate things: football fans endlessly cheer or boo the team's new signings and player formations; and management's virtues and shortcomings are a constant subject of discussion in many workplaces. We don't even have to agree for us to have a sense of community, sometimes just performing an evaluation can be enough.

However, differing evaluations can also create antagonism, even conflict, over everything from political opinions to taste in clothes. Criticising an anti-immigration stance or questioning a tight dress can put strain on a friendship – or even destroy it. Essentially, this is all about balance; confirmational agreement should not be too boring, and stimulating disagreement should not become a subjective argument.

The question is whether the digitalisation of social life has led to these continual evaluations becoming more common. Many of us now comment other's behaviour in real time by using 😅, 👍, ❤️, 💪 and so on, and it is no longer possible to exit from a shop or airport security without first passing a row of smiley faces that encourage you to press red or green buttons. What does this constant evaluation do to us? On social media, the evaluation and judgement of what we do is instantaneous and continual, possibly leading us to put higher expectations on

ourselves. Research shows that digital media negatively affects young people's mental health, resulting in depression and eating disorders.[4] The Public Health Agency of Sweden has also linked the greater demand for perfection to increased mental health problems.[5]

Assessment criteria and rating scales

Categories such as good or bad, success or failure, are of course fundamental to a continual process of evaluation, as they form poles in a charged field of different outcomes. One initial insight is that what is successful or unsuccessful depends on the evaluation criteria: a newly built residential area turned out beautifully, and people who live there are almost obscenely happy, but the cost of construction was triple what was budgeted. Is this a success or a failure?

Many evaluation criteria can be quantified, becoming a measure. In this context, in the present day, the most common measure is probably money.[6] In many situations, a painting that commands a high price is considered to be better or more successful than one that is cheaper. In this case, failed artists are those who do not sell anything and thus cannot make a living from their art. However, there are other measures, such as in Sweden's competition to select their Eurovision entry, where the scoring system appears to have been borrowed from judged sports such as figure skating or gymnastics. Here, it is a matter of

trying to measure the success or failure of a particular performance in comparison to other, similar, ones.

If there are grading scales for assessing the outcome of invested effort, it is also possible to compare failures. Some are more substantial than others, as they affect more people in a more profound way – others are considerably less so. A burnt potato gratin on an ordinary weekday evening is a small failure in the grand scheme of things, especially if those affected can afford to go to a restaurant instead. In fact, this could even live on as the fond memory of a failure turned into a positive shared experience.

With clear evaluation criteria and a scale, preferably a quantified one, it should be possible to compare the degree of success and failure in a given context. There are many examples of this type of more or less ambitious evaluation system; school grades are one. Here, the students' performance is assessed on the basis of relatively clear qualitative criteria. Tests translate these into quantitative measures. Some subjects include national tests, in which a student's knowledge can be quantitatively compared with that of other students. In Sweden, grades are then used to classify their performance from successful (A) to unsuccessful (F). Some families unofficially reinforce this grading system with money, giving bonuses for different grades, such as ten euros for each A grade.

In turn, to ensure that the grading system is a good evaluation system, it is itself regularly evaluated. Some-

times this leads to changes in the system – and perhaps it is a sign of the times that grades seem to be replaced at an ever-increasing rate. After the end of the nineteenth century, the newly developed Swedish system for school grades was in use for 65 years. This was replaced by a grading scale that was used for 32 years, until 1994, when a new grading system was introduced and lasted for 17 years. The most recent system has now been in place for 13 years, and is already being questioned. While it is easy to believe that we are being ever-more demanding in terms of school grades, there are many other explanations for this increasing frequency of change.

Moreover, there are other ways of trying to ensure that a scale is adequate for assessing effort, in terms of success or failure, than constantly changing it. One is currently underway in Swedish higher education, where each university is responsible for evaluating its courses and programmes through its quality assurance procedures. The Swedish Higher Education Authority then regularly assesses this quality assurance work. Here too, this involves evaluating evaluations. So as not to leave anything to chance, the Higher Education Authority also commissioned an external consultant to evaluate the effects of the entire system in 2020, resulting in an evaluation of the Higher Education Authority's assessments of universities' quality assurance procedures, in practice an evaluation of evaluations of evaluations.[7] All to ensure that

higher education maintains a particular minimum level of quality.[8] Hopefully, the urge to evaluate ends here.

Initially, I mentioned a few well-known stories of failure, with the common denominator being that they were preceded by excessive risk-taking, by pride. It is easy to believe that these stories were all about major disasters, as they have been passed down from one generation to the next. In reality, they are famous and oft-referenced because they illustrate how pride comes before a fall, how failures are often related to too many and too significant risks. The *Challenger* disaster resulted in seven deaths and had no lasting impact, other than on the families and the US space programme. Thirty-six people died in the flames of the *Hindenburg*, but most of those on board survived. Human lives are not to be disregarded, but in the end the damage was limited. These stories are not primarily based upon the consequences being profound or resulting in large numbers of deaths and injuries, but yet both accidents generated well-known narratives about failures of engineering.

Larger failures that affect more people and more severely, perhaps with large numbers of casualties – such as the *Titanic*, where around 1,500 people died – may in many cases receive far less attention. Just think of structural failures in food supplies for starving populations, which have historically resulted in hundreds of thousands of people dying, without this receiving any wider cover-

age. One of many such famines occurred in six Somali provinces in 2011, killing an estimated 258,000 people, half of whom were children under the age of five.

Naturally, this can be regarded as the UN World Food Programme's failure, as this organisation was established to counteract or even avert famines in different parts of the world. One reason for the scale of this disaster was that the UN withdrew its aid workers from the area because their safety could not be guaranteed. Nor did it help that several other international aid organisations could have taken the UN's place, but they too were inadequate. Meanwhile, the US had cut back its aid to Somalia to prevent resources falling into the hands of the terrorist al-Shabab organisation.[9]

Whether the failure of the relief programme can also be regarded as a successful strategy for winning the war on terrorism is, of course, debatable, but the point is that there is no absolute scale on which to judge failure, whether it be technical, as when the seven crew members died in the 1986 *Challenger* disaster, or political, as when more than a quarter of a million Somalis died of starvation in 2011. The human consequences are certainly not what has made an exploding space shuttle a more familiar symbol of failure in the Western world than a vastly more destructive and disastrous famine in the Horn of Africa. Instead, a space accident is a much better fit than a famine for our millennia-old view of failure: that pride comes

before a fall. One conclusion is that failures are relative, in the sense that they are based on evaluation criteria that may differ between one context and another and from one person to another. The *Challenger* disaster played into the hands of those critical of the US space programme's scale, who believed that taxpayer money could be better spent, for example on tackling poverty and deprivation in the US. The *Titanic* has been exploited by many people who have made money from telling and retelling this famous story in books and films. In the English language alone, there are several hundred titles about the fate of the famous vessel; the 1997 film starring Leonardo DiCaprio and Kate Winslet won 11 Oscars and grossed $2.25 billion. Even a brutal famine like that in Somalia in 2011 had its winners, in this case those who are trying to eradicate al-Shabab, as the terrorist organisation has needed to focus more on guerrilla warfare and terrorist attacks in the aftermath of the disaster, rather than controlling an area and taxing its inhabitants – and this is without mentioning the black marketeers and others who always follow in the footsteps of starvation, making money from the vulnerable.

Unavoidable failures

Although the degree of failure can perhaps be judged by different scales, one aspect that leads some failures to have more serious consequences is that they occur in a systemic context. The sociologist Charles Perrow has claimed that failures in systems can spread more widely and affect more people than those that occur in isolation.[10] Perrow's theory of unavoidable failures (he calls them normal accidents) is based on the idea that systems can differ in two ways.

First, they can be linear or complex. Linear systems are those that operate in predictable and proven contexts, where the course of events is visible and relatively easy to understand. Complex systems are those that are more unfamiliar and untested, where the course of events is not as clearly visible or easy to understand. Second, systems can be loosely or tightly coupled. Loosely coupled systems are those where a course of events in one part of the system has delayed consequences and alternative actions, giving people more potential to rectify the situation if something goes wrong. In tightly coupled systems, the

consequences are more immediate and also occur somewhat automatically. Here, the scope for human intervention that can avert undesirable outcomes is more limited.

One example of a linear, tightly coupled system is a rail network, where the functions are fairly easy to understand but disruption can have rapid and extensive consequences throughout the system. A supermarket can be seen as a linear, loosely coupled system, where problems can often be delimited and solved with a bit of flexibility. A complex, tightly coupled system could be a nuclear power plant, where small disturbances can result in an entire reactor needing to be shut down, and a complex, loosely coupled system could be an airport, where passenger, luggage and aircraft handling is not particularly transparent, but problems can often be dealt with more smoothly than in a railway network.

Using this categorisation, what Perrow concludes is that accidents cannot be avoided in tightly coupled complex systems. This is because in tightly coupled systems, such as rail networks, there is little time for reflection, so issuing orders should be centralised and follow a set and unquestioned routine, while for complex systems, such as airports, obtaining an overview is difficult, which instead makes decentralised decision-making more appropriate. Accordingly, tensions inevitably arise in the management of complex, tightly coupled systems, such as nuclear power plants, because the two organisational principles of cen-

tralised and decentralised management structures are difficult to combine. One solution is to ensure that such systems do not exist, perhaps by converting them into more loosely coupled systems, if possible.

Other, more empirically focused researchers have argued that, in practice, there is no contradiction; organisations that deal with this type of complex and tightly coupled system can exhibit centralised, rule-driven and predictable management during normal operations, while at times of heightened risk or stress they can devolve decision-making to operators in the field. The thinking is similar to that of military organisations. During the current war in Ukraine, military experts have frequently highlighted the organisational differences between the Ukrainian armed forces, which have adopted NATO's way of organising operational units, and the older way of thinking that is said to exist in the Russian military. The Ukrainian military leadership formulates operational objectives and units in the field decide how to achieve them, as they know the obstacles and opportunities best. The Russian military, however, has a strict hierarchy with orders that state not only what to do, but also how to do it. Dynamic organisations with the potential to adapt to their circumstances appear to be one way of avoiding failure in these types of situations.

Charles Perrow also claims that normal accidents in complex, tightly coupled systems risk becoming major

problems that impact large numbers of people, due to cascading effects. A good illustration of this line of thought is the famous butterfly effect, which originates from research into chaos in dynamic systems and entails that a butterfly's wing beat can cause a tornado. If the butterfly effect strikes a system that has the potential to affect many people, the consequences can be severe or even catastrophic – such as in nuclear accidents, which Perrow himself uses to illustrate his ideas.

His theory has been extensively discussed and criticised, because it is so general and makes such expansive explanatory claims; one weakness is that Perrow does not specify clear limits for when a system is complex or tightly coupled, which means that proof of these ideas is inadequate, and risks being more anecdotal than systematic.

Failures over time

Judgements about failures and their consequences depend on the evaluation criteria and thus, to some extent, who formulated them. This is also the case for normal accidents in complex, tightly coupled systems, where the potential for extensive effects from one misstep can be considered in evaluating its impact, making it possible to denote acceptable or unacceptable shortcomings. However, beyond the context of evaluation, there is the aspect of time.

This can be captured in two qualitatively different ways of evaluating successful or unsuccessful efforts.[11] One involves evaluations that aim to continuously correct an intervention, known as ex ante. For example, purchasing shares in the hope that their value will increase is something that can be continuously reassessed and evaluated using new information and changing circumstances. This combination of ex-ante evaluation and money as a measure is prevalent in one of our most institutionalised arenas for success and failure, the financial markets.[12] Another arena for ex-ante evaluations is Sweden's procedure for

governmental investigation, in which public enquiries aim to inform policy making by providing an overview, identifying problems and proposing measures.

The second way of assessing actions taken is through ex-post evaluations. Here, something is evaluated once it is completed – perhaps in the hope of learning something of benefit for similar endeavours in the future. The aim is not to intervene in an ongoing process, rather to understand what happened in a situation after it has become a fait accompli. If public inquiries can traditionally be considered ex-ante evaluations, reviews of all kinds are examples of ex-post evaluations. This could be assessing and perhaps rating a book, a film, a car or anything else, to provide guidance for interested parties. These judgements are of completed projects where influence is no longer possible, except perhaps for future creations, and then only in the long term.

Another example of ex-post evaluation is the famous story of the Edsel automobile brand, launched by the Ford group in the late 1950s. Edsel was named after Henry Ford's late son; the idea was for it to compete with other mid-range brands such as Pontiac, Buick, DeSoto and Dodge. This was a big step for Ford, which had so far relied mainly on its Mercury model to attract customers who could afford a slightly more expensive car, but not the very finest models.

Edsel was to appeal to people who wanted something

more high-end than its Mercury model, without having to buy luxury brands.

After a few years of intensive development, resulting in a bold design complemented by a powerful engine, several models were launched in 1957. The promotional work was enormous and included live television entertainment, with the hour-long *The Edsel Show*. This was hosted by Bing Crosby and featured Frank Sinatra and Louis Armstrong, with comedian Bob Hope as a surprise guest.

Despite this extravagant marketing campaign, sales were disappointing. Just to cover development costs, which were $250 million, it needed to sell 230,000 units annually for the first three years. But a total of only 116,000 automobiles sold during the three years that Edsel put models on the market, 1958–1960, before production was discontinued. Losses amounted to $350 million, which is equivalent to more than ten times that in today's money; they were so far in the red that it almost drove the entire Ford group into bankruptcy.

Many people have since tried to understand what went wrong for Edsel, and the explanations are many and varied. One of the most common ones is that the US economy went into recession in late 1957, just as the Edsel was being marketed hardest – so the brand was launched at the worst possible time. Moreover, the models had been presented as something genuinely new in the car market, as a brand that was very different from the others.

Still, Edsels were produced in existing Ford factories using the same chassis and powertrain as existing models – something that was recognised by customers and commentators alike.

Above all, pricing has been named as the culprit, because it made it hard to place Edsel in a defined market segment. While the models were being developed, Ford's management had reconsidered and changed its Mercury model to fit the market segment for which Edsel was intended. The result was that the most expensive Edsel model cost as much as the cheapest Ford, while there were cheaper Mercury models for those who wanted a car that matched the Edsel in comfort. Edsel had quite simply lost its intended price segment in the automobile market.

Edsel has been extensively evaluated ex post as an example of a marketing failure in the corporate world. In fact, the story of the automobile brand that almost drove the entire Ford group off a cliff has become a famous case study, used in many marketing education programmes around the world, because it does have educational value.[13] This failure has been useful as a cautionary tale for generations of aspiring copywriters and art directors, so Edsel has, over time, become something positive, at least for teachers and students of advertising.

For Ford, Edsel was and is an historic failure. For enthusiasts, however, it is now a valuable collector's brand with national owners' associations. As we have already

seen with the *Titanic*, among others, a common fate for monumental and subsequently rewritten failures is that they stir up interest, which creates demand. For Edsel, of course, it is a special twist of fate that low demand at the time of the failure is why there is now an interest in acquisition, when the failure is obvious to everyone.

Where evaluations can be carried out ex ante, meaning on an ongoing basis and to correct any errors that arise, they should influence action, providing opportunities to turn an impending failure into something less catastrophic. The situation is different for evaluations that are made ex post. However, this does not prevent failures from having more positive, albeit unexpected, consequences, particularly if these assessments are made using criteria other than the original ones.

Failures as a basis for improvement

The lessons of the Edsel case come from the vast research field that examines the management of risk and failure in organisations. What seems to characterise this, and much other writing on failure, is the hope of reducing the frequency of fiascos, preferably eliminating them altogether. We know a lot of research aims to contribute to progress by learning from experience; interestingly, the zeal for improvement in organisational research and the sociology of risk can also be said to mirror the idea that pride comes before a fall. For, contrarily, it seems that each mishap or case that is studied could lead to, if not excessive self-confidence, then at least increased faith in the risk assessments that need conducting prior to an intended action. The situation is slightly different in the natural sciences, technology and medicine, where knowledge creation is ideally based on accumulation, because new knowledge is always based on what was previously known. On this basis, there are no failed calculations or experiments, because even knowledge of what does not work is a useful piece of the puzzle when attempting to under-

stand something.[14] Here, it is important that there is no dishonesty or carelessness that allows research failures to be covered up.

Regardless of whether an action is successful or unsuccessful, or the evaluation is performed ex ante or ex post, it can influence future assessments. Analyses of future circumstances can create ideas about what is to come, leading to investments that, in turn, increase the chances of a prediction actually being true. This – that predictions in themselves increase the chances of them happening – is sometimes called performativity. Of course, it is difficult to determine how important a particular conception of the future has been to its realisation. Could Jules Verne's two novels *From the Earth to the Moon* (1865) and *Around the Moon* (1870) really have influenced the design of the US's Apollo programme? Some people say so.[15] Still, even if the limits of predictions' influence have been debated, no one questions the reality of performativity.[16]

Historically, the type of performative idea that is confirmed in the future is thus difficult to assess – yes, there are many examples of visions being realised: investments in developing mobile phone networks for cordless car phones led to small personal mobile phones and then small handheld computers. Not least, Swedish efforts to build wireless telephony systems have created national growth, but have also attracted international attention for

methods used in countries with widespread corruption – such as when a Swedish mobile network operator paid billions of dollars to a powerful person in a Central Asian country to establish itself there. Similarly, investments in the Swedish medical and pharmaceutical industry have often led to the realisation of visionary dreams, and the same applies to markets for organ trading – covered in Susanne Lundin's essay in this collection – even if they have not always developed in ethically defensible ways.

But what about the vast resources that were invested in the 1950s and 1960s, with the aim of making Sweden self-sufficient in uranium for domestic nuclear power and a national nuclear weapons programme? These did lead to an internationally competitive Swedish nuclear power industry, not something to be disregarded in a small country. But, at the same time – and despite breathtaking investments in research and development – none of the plans for uranium mining, enrichment, the production of heavy water, reprocessing of spent nuclear fuel, self-sufficient Swedish nuclear power or Swedish nuclear weapons came to fruition.[17] Fortunately, one might think, the performative power created by ample resources is not always enough to realise technological ambitions. Towards the end of the 1960s, the dream of Swedish nuclear weapons fell flat, in what must ultimately be called a failure, under the pressure of technical problems in a reactor in Marviken – as described in Per Högselius' essay – and

accompanied by political protests and international non-proliferation agreements.

Performative powers apparently have limits, but there are still plenty of examples of how historical visions have influenced our lives today. It would be strange otherwise. Perhaps any change that requires effort and resources must be guided by a vision of a different future or, in other words, ex-ante evaluations, as a necessary but insufficient condition. Our contemporary visions will probably also affect our children's world. Hopes for small modular nuclear reactors that will revolutionise power generation, and artificial intelligence that will take over a lot of creative work, mean that investors are putting significant resources into development in these areas. Because these visions are relatively easy to establish in parallel in different countries and regions, resources are being invested in the same areas of research and development almost globally. Calls for funding for the development of automated systems, such as self-driving cars, are being announced at the level of the EU and in individual member states. With this investment, it is hard to believe that the technology will not be in place within a decade or two.

What often causes problems is that visions that lead to major investments have serious political implications, so alternatives are easily suppressed and forgotten. Today's small modular reactors could be the solution to our

growing need for electric power, or they may fare badly against offshore wind power in electricity systems with virtual inertia and greater potential for energy storage in battery parks or pumping stations.[18] In questions of this kind, visions are pitted against each other, as is expertise. Contemporary evaluations and investments are often strongly ideologically charged, rather than based on comparable visions of the future on differing foundations. The calculations of our future need for electric power that were made in the 1950s and 1960s have, in retrospect, proved to take excessive account of growth and were thus greatly exaggerated. We risk making the same mistake again if current forecasts of the increasing demand for power similarly underestimate the results of conservation measures and efforts to increase energy efficiency.

Today's decisions on future infrastructure often have very long lead times; this applies as much to energy systems as to transport systems. Europe's newest nuclear reactors have taken 18 years or more to build, from licence to operation and new mainlines for high-speed trains have been estimated to take 25–30 years to complete.[19] The really big failures of today will not be known for number of years or decades from now. If then.

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Riksbankens Jubileumsfond: promotes, inspires and participates

Research within the humanities and social sciences is necessary to understand and manage societal challenges, nationally and globally. Riksbankens Jubileumsfond (RJ) is an independent foundation that supports and promotes high-quality research in the humanities and social sciences. This year, 2024, the foundation celebrates 60 years of its activities. Over the decades, thousands of research projects have received support, in various forms and to differing extents, and RJ has become established as one of Sweden's most important research financiers.

The foundation was created when the Swedish central bank – Riksbanken – wished to both mark its tercentenary in 1968 and to support an important national objective linked to science and research. Riksbanken thus made one donation to establish the Prize in Economic Sciences in Memory of Alfred Nobel, and another donation to support upcoming research. In 1964, the Swedish Riksdag decided to establish a foundation to manage this donation – Riksbankens Jubileumsfond.

In the years up to 2023, the foundation has provided a total of SEK 18.7 billion in research funding.

RJ 2024
Failures?
Editor: Jenny Björkman
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An unforeseen disaster is an accident, but if it could have been predicted, it is a failure. Icarus was warned by his father, but his pride made him fly too close to the Sun – one of the Western world's most famous failures. Some accidents take a long time to become predictable disasters. The impact of carbon emissions on the climate is one such failure, the consequences of which were long unforeseen.

How can risk be minimised to prevent failures, and what does a slice of Swiss cheese have to do with it? And once failure is a fact, when trains do not run, when the grading system does not work as intended, or when healthcare queues grow and grow, how can evaluations do anything to solve this?

In 2024, Riksbankens Jubileumsfond publishes an essay collection under the title *Failures?*. Thomas Kaiserfeld, historian of ideas, writes about historical and contemporary failures and unforeseen consequences.

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